Taking Photographs and Processing Images

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In fieldwork, how information is recorded is an important point in improving research quality. Fieldnotes are of course significant, but the prevalence of compact digital cameras that can easily be taken into the field is changing the way that fieldnotes are taken, and it is necessary to adapt the ways in which information is recorded according to the character of the field and the theme(s) of the research. My specialization is art history (Italian frescoes), so I shall talk about the use of digital cameras to take photographic records and the subsequent management and processing of image data in the context of my own fieldwork.

Taking photographic records will involve using a digital camera or digital video recorder. When using a digital camera, in principle, audio information is not recorded. Where necessary, comments on the subject of the photography should be noted down in field notebooks and be photographed with the subject, or a digital voice recorder should be used to record the relevant information. In cases where a video camera is used to record the circumstances in the field more realistically, you may make comments as you record the scene, and this may be more effective than recording your comments in field notebooks. With digital cameras, it has become easier to add scales and measures to images, such as color charts and gray charts that are benchmarks for color management, temperature indicators, humidity indicators, compass marks, laser range finders, and so on. Data on the date and time of the recording will, with most digital cameras, be automatically recorded, so needs no particular attention. Depending on the type of digital camera used, it may also be possible to take infrared photographs, which can be useful when recording animal life at night, as well as art works and cultural property. It is recommended that you choose a camera model that best meets the needs of your field.

The rapid evolution of digital cameras has made fieldwork more functional, and it is now possible to collect a vast amount of data—unimaginably more than would have been possible before—in a limited period, but it is worth noting that simply having a digital camera does not guarantee that the researcher will be capable of the kind of advanced photography required if those photographs are to be used as research material. Firstly, the researcher must have a basic understanding of photography, and must be able to fully use his camera. That means not relying just on the camera's automatic settings and default programs, but rather learning to use the manual mode as much as possible, and studying the mechanism of cameras and the basics of photography.

1. Items required for photography

1) Digital camera: a single-lens reflex camera of the highest quality possible. Having a mirror lock-up is an advantage when using the slow-speed shutter (since it reduces vibrations within the camera).

2) Lenses: in terms of mobility, a zoom lens is ideal, but it is recommended to collect a number of single focus lenses, with low distortion and a low f-number (for brighter images): standard, wide angle, telephoto, and even a macro lens for close-ups where required.

3) Lens maintenance items: cleaning cloth, blower

4) Color chart, gray chart: when taking photographs of art works or art-related subjects, in which the accurate recreation of color is vitally important, at least one frame

should show the color chart alongside the subject.

5) Tripod: a tripod is a pain to carry in the field, but it can be used with a level for measuring accurate horizontal lines, and makes it possible to use slow-shutter settings, so wherever possible a tripod should be taken to the field. At the very least, a monopod should be taken.

6) Remote shutter release: useful when using slow-shutter settings or for long exposure photography, although the self-timer can also be used.

7) Flash: photographs taken with a flash result in images that look very flat, but a flash will allow you to take photographs in dark locations at the same color temperature as those taken in sunlight. To avoid taking photographs that are very flat and also to avoid the head-on reflection of the flash from flat surfaces, adapt your methods as required: for example, try bouncing the flash off the ceiling, diffusing it with tracing paper, or using a slave unit to fire a flash away from the camera.

8) Spare camera: if your camera breaks during fieldwork, you will have lost an important opportunity for research. Take at least one spare camera with you (it does not have to be single-lens reflex).

9) Recording media, battery and charger: be aware of differences in electrical voltage and plugs if traveling overseas.

10) Photo viewer: for longer-term fieldwork, a photo viewer can be very valuable, particularly for checking color detail, and backing up large amounts of photo data.

11) Clothes: ideally, the photographer should wear black (just as black is the best color for camera bodies), in case he is reflected in glass and shiny surfaces and to avoid the colors of his clothes reflecting onto the subject as a result of the direction of the light.

2. Photography basics

1) The proper exposure is obtained through the right combination of aperture and shutter speed.

The field is quite different from a studio, where delicate and complex calculations on light rays are made. There is, therefore, no need to make any such calculations using a separate exposure meter; correct exposure will be indicated by the camera's built-in exposure meter, so in general there should be no need for exposure compensation, apart from certain special circumstances. Photographs taken should be checked via the camera's play mode, and if doubt remains, the exposure can be adjusted by one step (either under or over) and the photograph retaken. It is also possible to adjust exposure later by using image processing software on a computer, so there is no particular need to become over sensitive about it in the field.

2) The right combination of aperture and shutter speed is determined by the objective and circumstances of your photography.

Correct exposure refers to the process of evening out the amount of light that reaches the film plane. So either the aperture should be changed, or the shutter speed, in order to adjust the amount of light. There is any number of combinations for achieving the correct exposure, and any combination is theoretically the same, but the most appropriate for the circumstances must be selected. For example, if the subject is moving, then a reasonably fast shutter speed will be required, and the shutter speed setting should be prioritized. When you want to take sharply focused images (pan-focus effect), the aperture size should be decreased as much as possible, as is the case with a pinhole camera.

Having said that, when taking photography in the field, and particularly when not using a tripod, there are limitations on how much the shutter speed can be decreased because of the high risk of blurring due to hand movement. In general, when taking photographs with a standard lens, even professional photographers will not take the shutter speed below 1/8 second. With a wide frame lens, blurring is not particularly conspicuous, but with a telephoto lens, any blurring will be amplified. It is important that you are aware of the risk of blurring from hand movement associated with each lens.

3) Modern digital cameras allow the photographer to set the ISO/ASA levels that control the film's (image sensor's) sensitivity to light. Numerical values for ISO/ASA can generally be set to 50, 100, 200, 400, 800, 1600, or 3200 as required. The higher the value, the greater the film's sensitivity to light, so in dark places, the ISO/ASA value should, in theory, be increased. In general, however, the ISO/ASA value is set at 100, and the higher the value (the greater the sensitivity), the greater the noise in the resulting image. With film photography, this means that the granularity increases, resulting in a gritty image, while the lower the ISO value, the smoother the grain, resulting in great coloring. The same principles apply to digital camera photography.

Incidentally, each ISO/ASA value (50, 100, 200, 400, 800, 1600 and 3200) corresponds to each exposure "step" (either one shutter speed step or one aperture step).

4) Human eyes are able to ignore differences in light source. With cameras, however, differences in color temperature according to light source will be reflected accurately in the resulting images. The color temperatures of tungsten lighting, fluorescent lighting, and strobe lighting, and even sunlight at morning, noon, and evening, are all different, so with film photography, I would always use a color conversion filter to make adjustments. In general, photographers have had to deal with mixed light sources, which made accurate color reproduction very difficult. With digital cameras, however, it is generally enough to have the white balance function on the auto setting. If great accuracy in color reproduction is required, then a white piece of paper should be held in front of the viewfinder, and the white balance adjusted manually.

5) The composition of a photograph must be adjusted according to its subject—architecture, sculpture, paintings, craft works, and so on—as well as the objective of the research. However, in terms of recording fieldwork data, photographs should be taken not just according to what you want to record for the purposes of your own research, and not just for the details, but rather from as many angles as possible (with digital cameras there is no need to be concerned about the number of film rolls required), or in such a way that the surroundings are also shown. It is good practice to get into the habit of taking images of your own notes, temperature indicator, laser range finder, or compass, together with the subject. Images should also be taken of any explanatory panels, maps, pamphlets, timetables of local bus routes, and anything else relevant in the locality. Taking a church as an example, even if the only things of relevance to your research are a single chapel and the carvings or the altarpiece inside it, if you do not have pictures of the entire church, there is a risk you will forget the exact location of that chapel within the church. In many cases, the front facade of a church, its nave, the stone monuments buried in the floor, and the church surroundings may all provide valuable information.

3. Image management and processing

In the case of fieldwork, the first step of good image management is to create folders for each day of fieldwork and save images in the relevant folders. Simply put, if records are kept chronological, it is easier to recall your own memories of the fieldwork. Put any relevant audio recordings taken with your digital voice recorder in the same folder, along with any digital video files. Scan your field notebooks, and save the relevant pages as PDF files in the same folder.

Moreover, as the number of image files you have taken throughout the course of your research increases and your research progresses, the categories under which you need to categorize your data should become clearer. At that time, the data you have stored chronologically should be copied and the copies moved to and stored in the new category folders. Image management software can be used to create your own databases. It goes without saying that data should be backed up, with at least 2 external hard drives and 1 DVD copy. Portable hard disks, even those that are sold as shock resistant, are still a risk; data can be entirely wiped in a single instance if the disk is dropped, so they should only ever be used as additional backup.

Whenever an image needs to be processed, for whatever reason, it is vital that the altered image is saved with a different name in a different file from the original data. Photographs taken as part of fieldwork may be processed using

Adobe Photoshop or similar image processing software to correct levels, brightness, or contrast, to make color corrections, to sharpen or trim the image, or to correct distortion. These changes, along with any changes made to the shape or resolution of a file, or to its file format, or if text is added to an image file, the amended file must be saved under a different name. Under normal circumstances, the checking and correcting of images is done with reference to the screen of a computer, but a standard laptop computer screen is not sufficiently reliable in terms of strict color reproducibility, smooth gradation expression, correct color temperature, and brightness and color stability. Even with a professional standard color management monitor, a consistent display environment needs to be maintained, meaning that regular calibration is required.